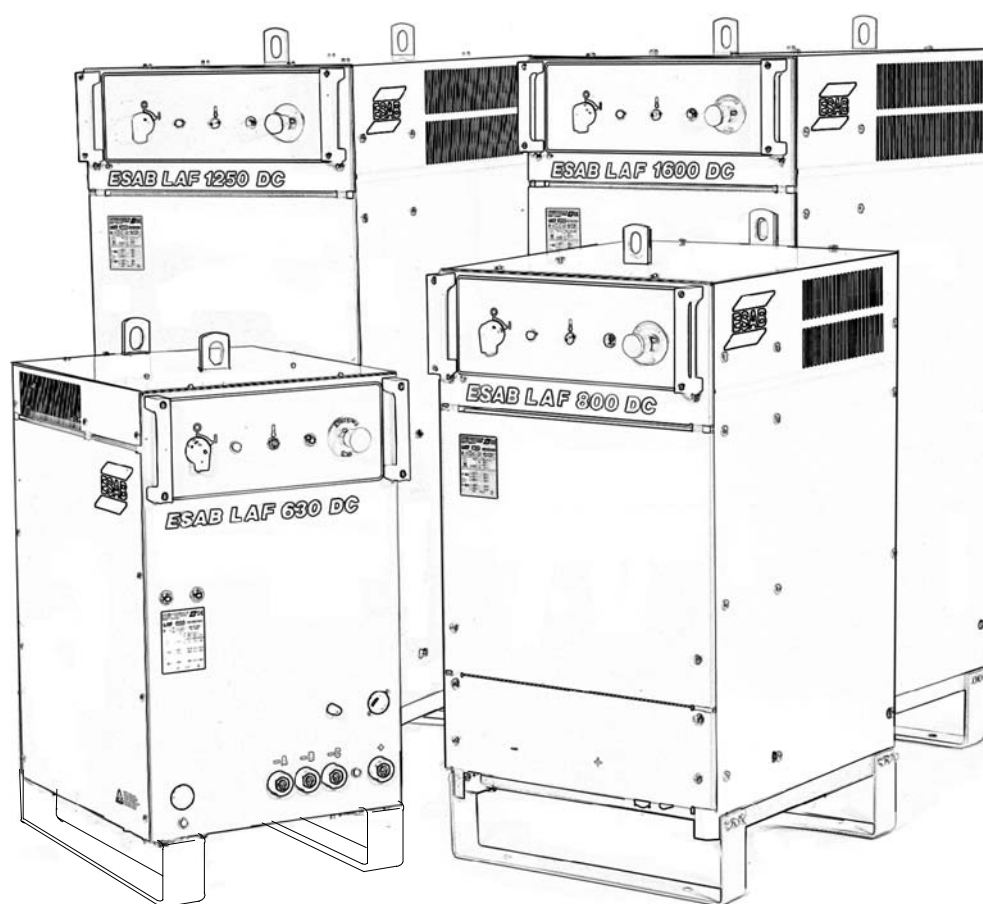




LAF 630/ 800/ 1250/ 1600 DC



Service manual

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READ THIS FIRST

This service manual is intended for use by technicians with electrical/electronic training, for help in connection with fault-tracing and/or repair.

Use the connection diagram as a form of index for the description of operation and the component description. The circuit board is divided into numbered blocks, which are described individually in more detail in the description of operation. All component names in the connection diagram are listed in the component description.

This manual contains details of all design changes that have been made up to and including November 1998.

SOFTWARE VERSIONS

From production start July 1997 486525880
LAF 1.00A

98.09.01 486525880
LAF 2.0

Stainless steel welding improved (error 39)

This software works only together with the new power source board 0486368001A
TAF is supported by the program

HARDWARE VERSIONS

98.09.01 Circuit board 486368880 with component layout 496367001A
Software version LAF2.0

Modification:

Hardware has been upgraded for improved stainless steel welding.

New transformer (T1) used.

Switch (IC 30) added for improved stainless steel welding (Function only accessible together with software version LAF2.0 and higher (see also comments for software version LAF 2.0).

Improvements in voltage- and current measuring (C11 and C21 added).
D39 and D40 added to improve max. output voltage from power source



WARNING



ARC WELDING AND CUTTING CAN BE INJURIOUS TO YOURSELF AND OTHERS. TAKE PRECAUTIONS WHEN WELDING. ASK FOR YOUR EMPLOYER'S SAFETY PRACTICES WHICH SHOULD BE BASED ON MANUFACTURERS' HAZARD DATA.

ELECTRIC SHOCK - Can kill

- Install and earth the welding unit in accordance with applicable standards.
- Do not touch live electrical parts or electrodes with bare skin, wet gloves or wet clothing.
- Insulate yourself from earth and the workpiece.
- Ensure your working stance is safe.

FUMES AND GASES - Can be dangerous to health

- Keep your head out of the fumes.
- Use ventilation, extraction at the arc, or both, to keep fumes and gases from your breathing zone and the general area.

ARC RAYS - Can injure eyes and burn skin.

- Protect your eyes and body. Use the correct welding screen and filter lens and wear protective clothing.
- Protect bystanders with suitable screens or curtains.

FIRE HAZARD

- Sparks (spatter) can cause fire. Make sure therefore that there are no inflammable materials nearby.

NOISE - Excessive noise can damage hearing

- Protect your ears. Use ear defenders or other hearing protection.
- Warn bystanders of the risk.

MALFUNCTION - Call for expert assistance in the event of malfunction.

READ AND UNDERSTAND THE INSTRUCTION MANUAL BEFORE INSTALLING OR OPERATING.

PROTECT YOURSELF AND OTHERS!

WARNING

This product is intended for industrial use. In a domestic environment this product may cause radio interference. It is the user's responsibility to take adequate precautions.

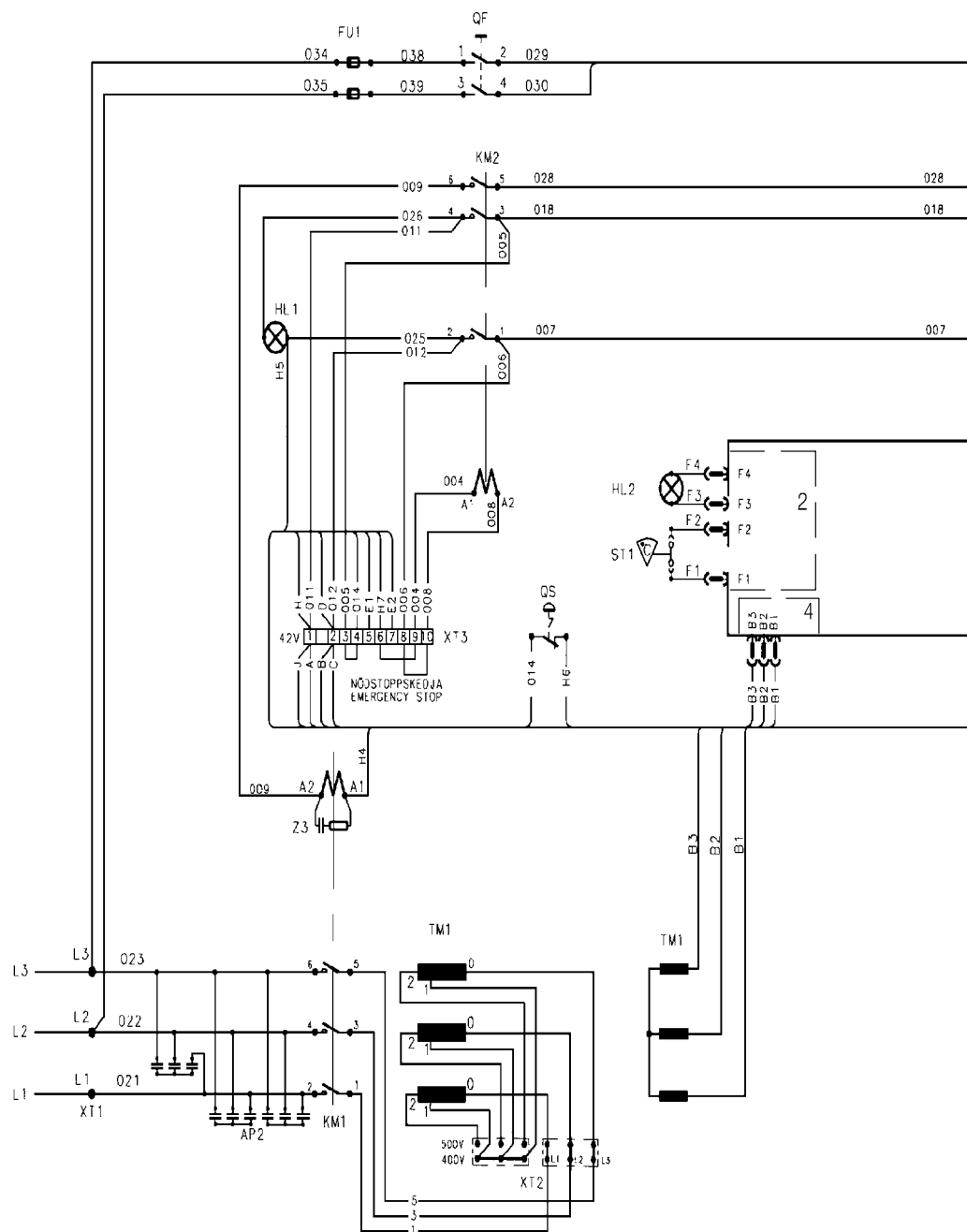
COMPONENT DESCRIPTION, LAF 630/800/1250/1600

Unless otherwise stated, the components listed below are those as used in the LAF 630, LAF 800, LAF 1250 and LAF 1600.

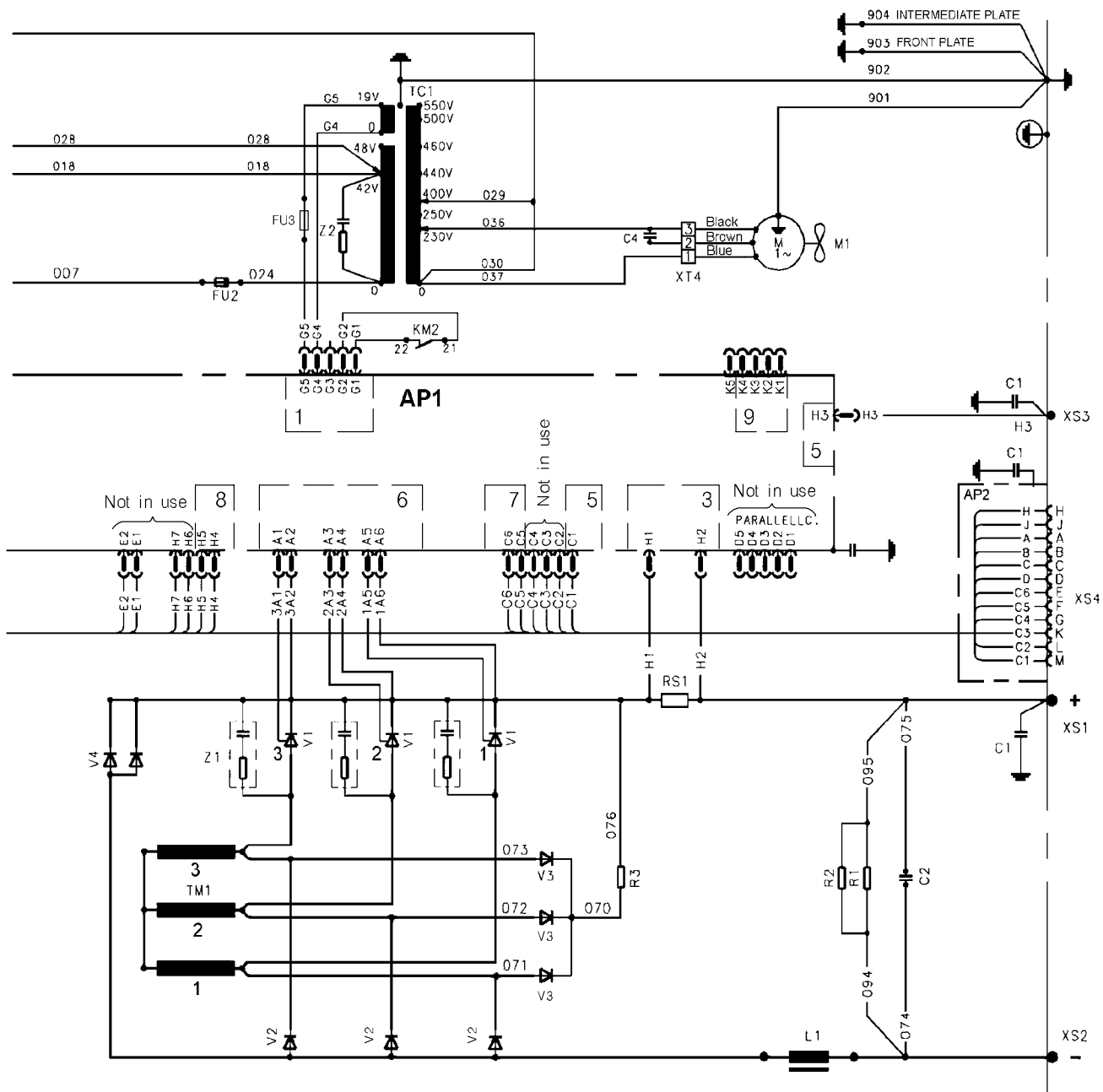
AP1	Circuit board
AP2	Circuit board, EMC filter (only for LAF 800/1250/1600)
C1	Capacitor, 1.0 μ F
C4	Capacitor
FU1	Fuse, 16 A slow-blow
FU2	Automatic fuse, 15 A
FU3	Fuse, 315 mA (only for LAF 800)
HL1	Indicating lamp (white), for Power On indication.
HL2	Indicating lamp (yellow), for indication of excess temperature.
KM1	Main contactor.
KM2	Auxiliary contactor (see page 15)
L1	Inductor
M1	Fan
QF	Main On/Off switch (see page 27).
QS	Emergency stop pushbutton.
R1, R2	Resistor, 50W, 80 Ω
R3	Resistor (only for LAF 630/800)
R4	Resistor, inductor (only for LAF 630)
RS1	Shunt (see page 16)
ST1	Thermal cutout (see page 16)
ST2	Thermal cutout (only for LAF 630), (see page 16)
TM1	Main transformer.
TC1	Control power supply transformer, 42V, 900 VA
TC2	Transformer for synchronising pulses (only LAF 1250/1600)
V1	Thyristor 1100A/300V (only for LAF 630/800/1250) 1500A/500V (only for LAF 1600).
V2	Diode.
V3	Diode bridge (basic current bridge) (only for LAF 630/800)
V4	Diode (only for LAF 800/1250/1600) Diode bridge (basic voltage bridge) (only for LAF 630)
XS4	Burndy contact, 12-pole.
XS3	Pole terminal for voltage measurement.
XT2	Terminal block.
Z1-Z3	Suppressor

CONNECTION DIAGRAM, LAF 800

Connection block XT2 is connected for 400/415 V / 50 Hz, see the connection instruction on page 28.



claf0e3a

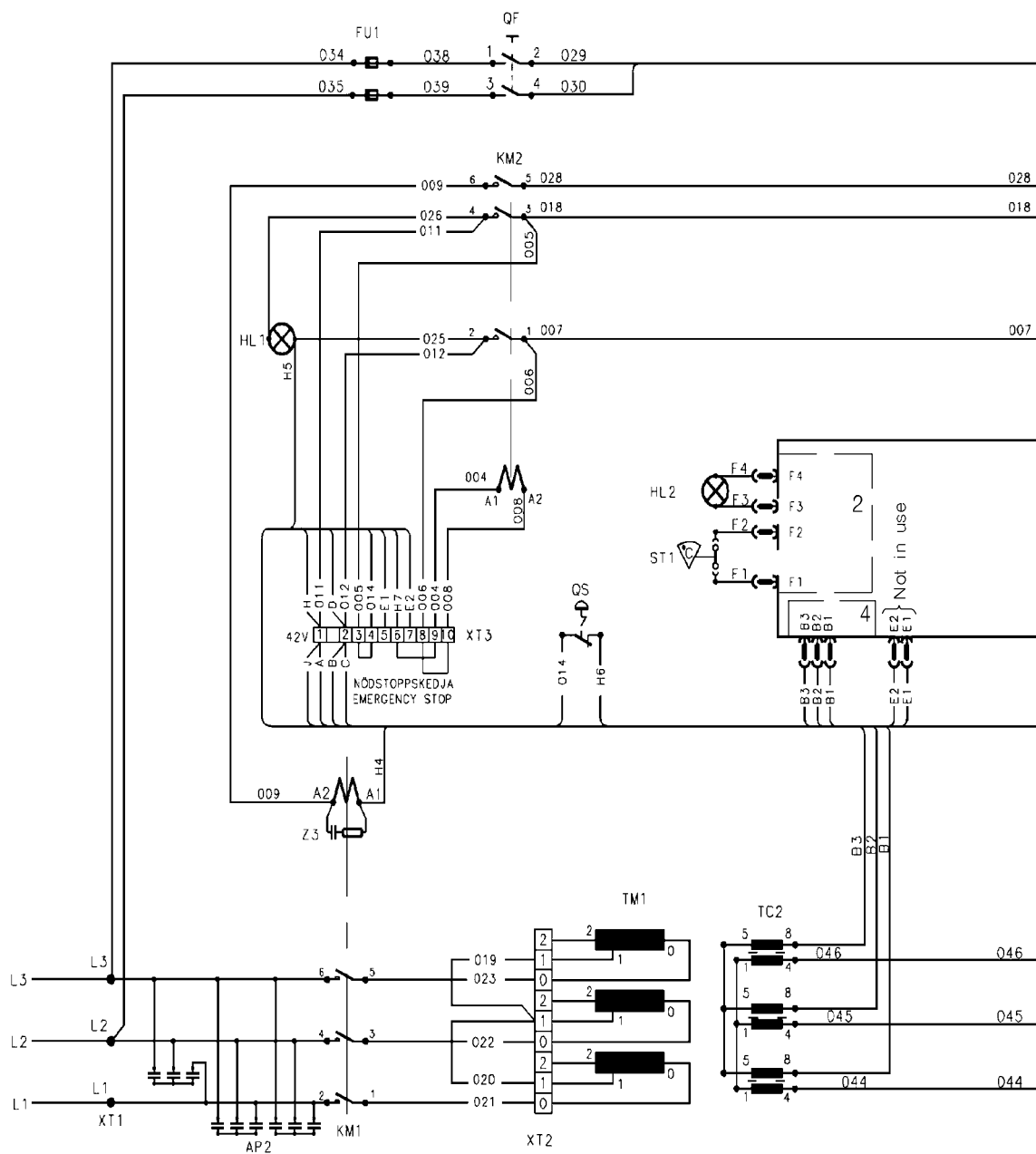


- | | |
|----------------------------|------------------------------|
| 1. POWER SUPPLY | 6. THYRISTOR FIRING CIRCUITS |
| 2. THERMAL OVERLOAD CUTOUT | 7. COMMUNICATIONS INTERFACE |
| 3. SHUNT INPUT | 8. START/STOP |
| 4. SYNCHRONISING | 9. TEST INPUT |
| 5. ARC VOLTAGE | |

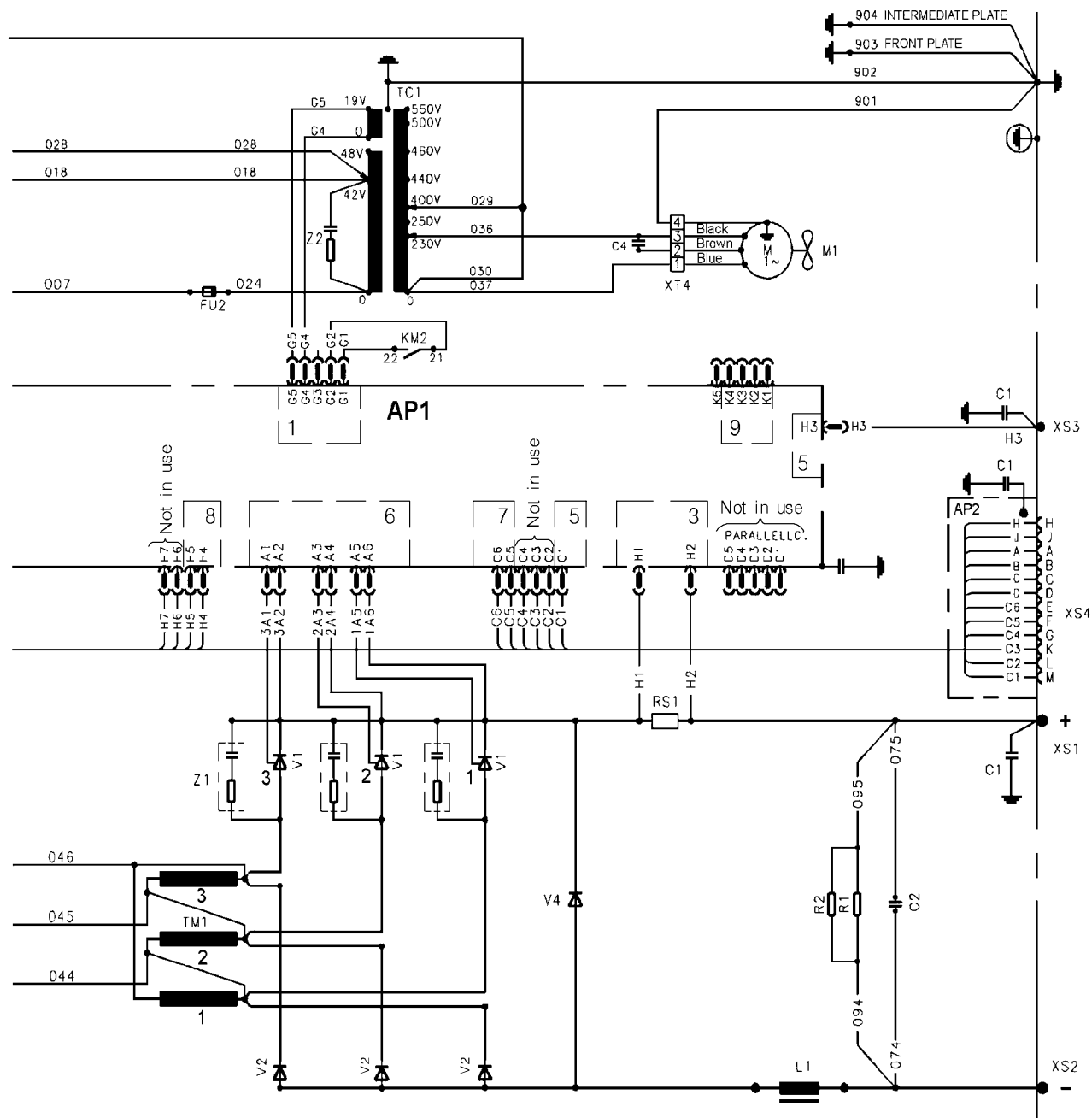
Numbers 1 - 9 refer to the description of operation on pages 15-20.

CONNECTION DIAGRAM, LAF 1250/1600

Connection block XT2 is connected for 400/415 V / 50 Hz, see the connection instruction on page 28.



claf0e4a



- | | |
|----------------------------|------------------------------|
| 1. POWER SUPPLY | 6. THYRISTOR FIRING CIRCUITS |
| 2. THERMAL OVERLOAD CUTOUT | 7. COMMUNICATIONS INTERFACE |
| 3. SHUNT INPUT | 8. START/STOP |
| 4. SYNCHRONISING | 9. TEST INPUT |
| 5. ARC VOLTAGE | |

Numbers 1 - 9 refer to the description of operation on pages 15-20.

Circuit board with part no. 0486 368 001



DESCRIPTION OF OPERATION

Circuit board AP1 - Main features

Circuit board AP1 is built up around a microprocessor and associated program memory.

There are two DIP switches on the circuit board (see page 26):

- SW1, for entering the power unit's address
- SW2, for entering the size of the power unit.

The circuit board communicates with the PEH control unit and with any other units that may be in use by means of a two-wire serial bus (a LON bus).

There are also analogue circuits on the circuit board for measuring the arc voltage and shunt signals, together with circuits for firing the power unit's thyristors.

The board can be divided into three function blocks:

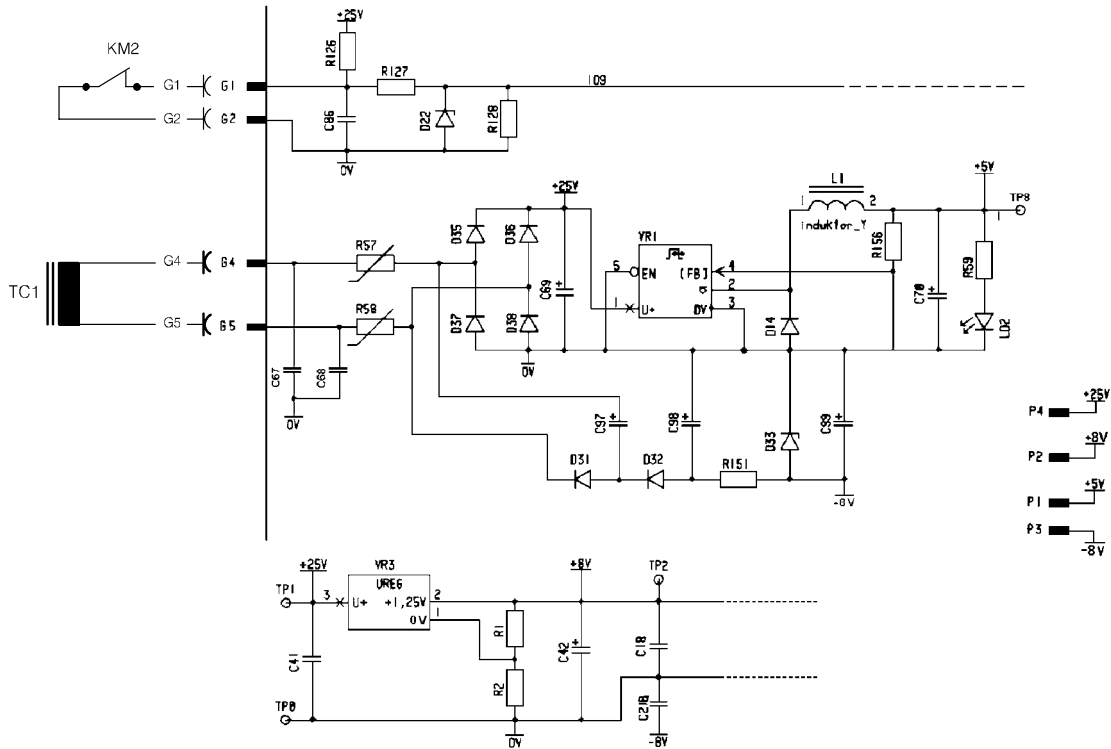
- **Internal power supply**
Supplies power at the appropriate voltages to the electronics on the board.
- **Processor**
Controls the welding voltage and current and communication with the PEH control unit.
- **Analogue section**
Converts measurement and control signals to levels that the processor can deal with and converts the processor's output signals to levels as required by the power unit.

Program monitoring

A red LED is fitted to the circuit board and lights if the microprocessor cannot read its program. If this LED is lit or flashing, check that memory chip **IC6** (see page 26) is fitted and that it is correctly orientated.

Sections 1 – 9 below refer to the circuit diagrams on pages 6 – 11.

1. POWER SUPPLY



Checking the external power supply:

Measure the incoming power supply at contact G between terminals G4 and G5.

The voltage must be $19\text{ V} \pm 2\text{ V AC}$.

Short-circuit protection for the circuit board is provided by PTC-resistors R57 and R58.

If the current rises to 0.6 A, their resistance rises and they interrupt the current.

When they have cooled, they will conduct again.

Checking the internal power supplies:

A green LED fitted to the circuit board indicates that the +5 V supply is on.

This voltage and other power supply voltages can be measured by a voltmeter at terminal block P (see the position on the circuit board on page 12).

Connect the negative terminal of the voltmeter to GND (see the circuit board on page 12).

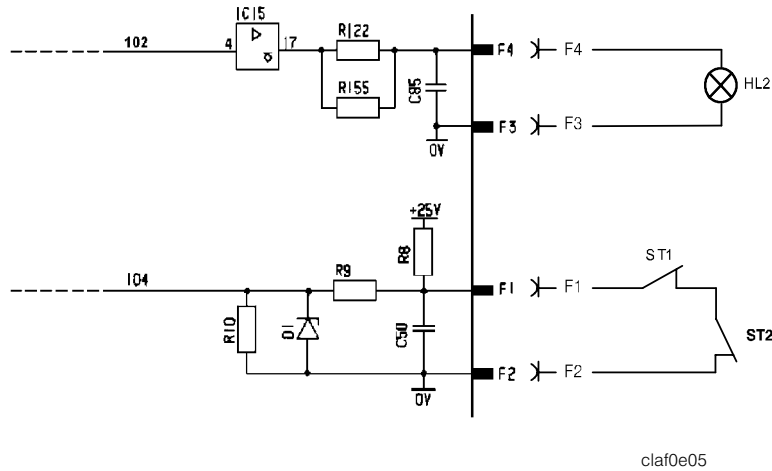
- P1 + 5 V $\pm 0.1\text{ V}$
- P2 + 8 V tolerance: +0.3/- 0.1 V
- P3 - 8 V tolerances: +0.1/- 0.3 V
- P4 + 25 V $\pm 3.0\text{ V}$

Loss of power supply

If main contactor KM1 opens, then auxiliary contactor KM2 also opens.

The voltage at input G1 then becomes 0 V and a message is sent to the PEH control unit that the power supply is about to fail. This causes the PEH unit to store the set values of welding parameters.

2. THERMAL OVERLOAD CUTOUT



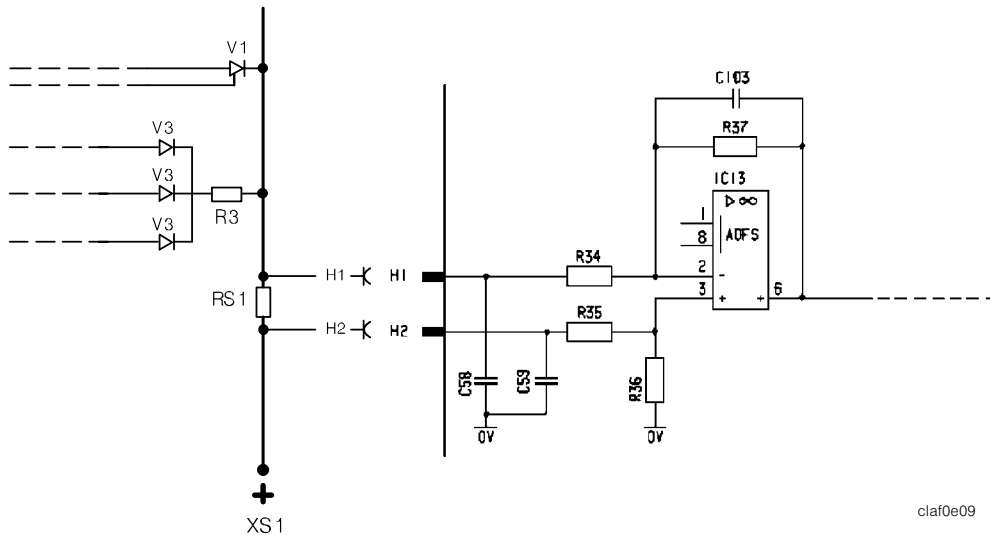
Thermal overload cutout switch ST1 in the power unit operates (opens) at a temperature of $92 \pm 3^\circ\text{C}$, raising the voltage at input F1 to about 20 V.

The voltage at output F4 then rises to about 18 V, which lights lamp HL2 on the front panel of the power unit. At normal temperature, the voltage at input F1 = 0V.

Thermal cutout switch ST1 resets (closes) at a temperature of $73 \pm 3^\circ\text{C}$.

Thermal cutout switch ST2 is fitted only to the LAF 630. It operates at a temperature of $160 \pm 5^\circ\text{C}$ and resets at a temperature of $130 \pm 15^\circ\text{C}$.

3. SHUNT INPUT



Inputs H2 and H1 measure the shunt signal.

For the LAF 630, the shunt (RS1) generates a signal of 60 mV at 600 A.

For the LAF 800 and LAF 1000, the shunt (RS1) generates a signal of 60 mV at 1000 A.

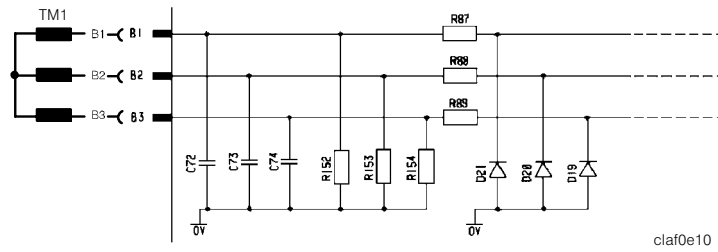
For the LAF 1250 and LAF 1600, the shunt (RS1) generates a signal of 60 mV at 1500 A.

DIP switch SW2 (see page 26) is used to set the correct shunt signal.

4. SYNCHRONISING

LAF 630

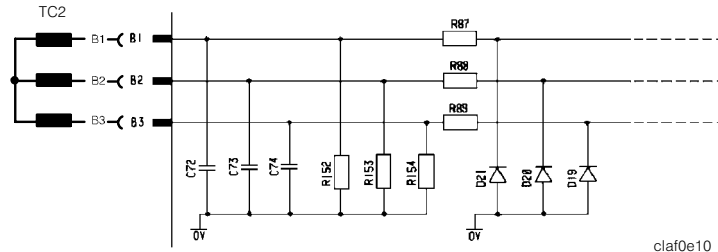
LAF 800



claf0e10

LAF 1250

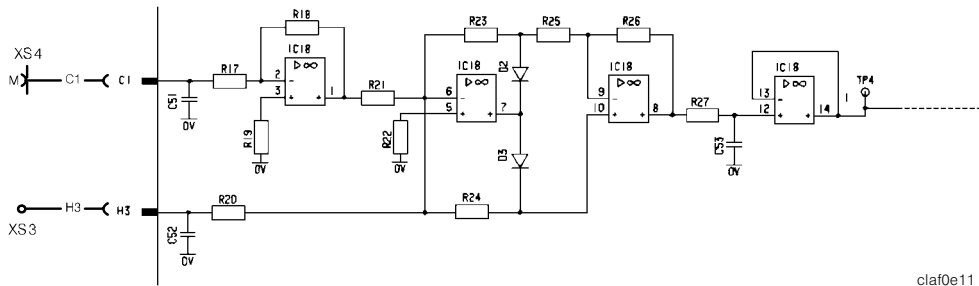
LAF 1600



claf0e10

The thyristor firing circuits are synchronised with the mains by three zero crossing detectors, with the phase voltages being sensed at inputs B1, B2 and B3 respectively. The voltage between the inputs must be 12.5 V AC \pm 2 V.

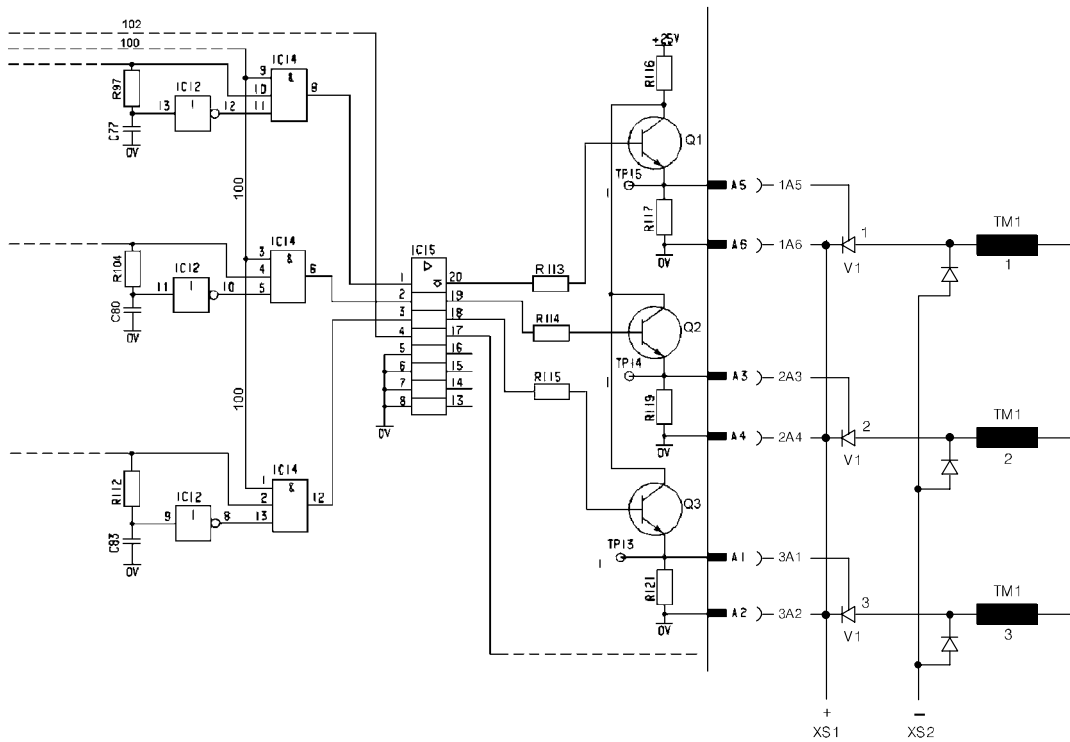
5. ARC VOLTAGE



claf0e11

Inputs C1 and H3 measure the arc voltage between the welding torch and the workpiece, regardless of the polarity of the filler wire. The maximum arc voltage that can be handled is 90 V.

6. THYRISTOR FIRING CIRCUITS



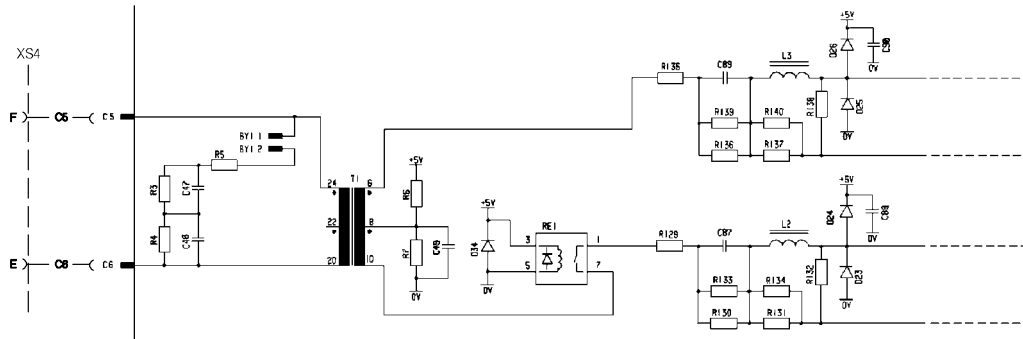
claf0e06

The firing signals for the thyristors are carried on outputs A1- A2, A3 - A4 and A5 - A6.

The firing pulse peak voltage is about 20 V when the thyristors are disconnected, and the pulse duration is about 350 μ s.

NEVER disconnect individual thyristors. This can unbalance the thyristor bridge and destroy the other thyristors.

7. COMMUNICATIONS INTERFACE



claf0e12

To reduce the sensitivity of the communications circuits to interference, the communication bus is galvanically isolated from other circuits on the circuit board by means of transformer T1.

If a communication failure is suspected, check the resistance of the mains side of the transformer with an ohmmeter between pins C5 - C6.

NB: Contact C must be disconnected when making the measurement.

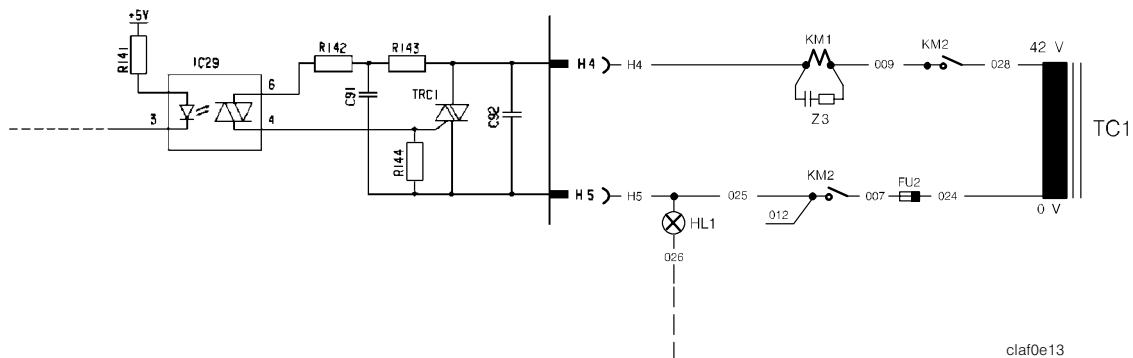
The correct winding resistance is about 1 ohm.

For reliable communication over the bus, it must be terminated by a filter at each end.

This filter is connected by a link at BY1.

If a power unit is connected to the bus, then the filter must be connected by linking BY1.

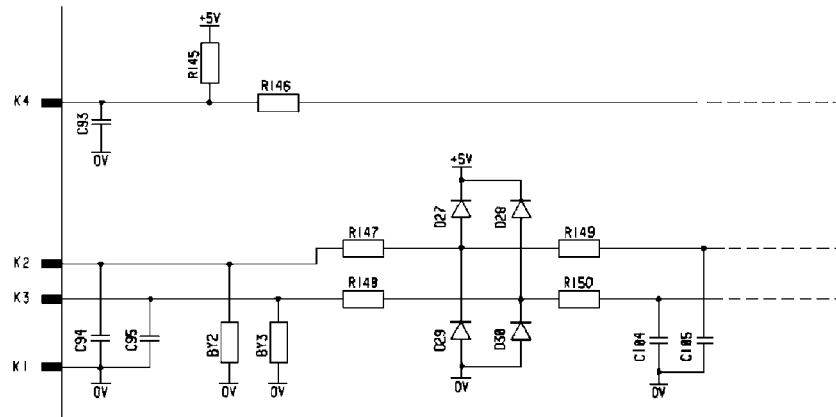
8. START/STOP



claf0e13

Outputs H4-H5 control the power unit main contactor (KM1) for starting and stopping welding.

9. TEST INPUT



claf0e14

Contact K enables the power unit to be controlled without the PEH control unit.

A special test device can be used (see the drawing on page 21).

With the switch on the test device at Position 1 (input K4 = 0 V), a special test routine in the program is called.

Main contactor KM1 operates and the thyristor firing angles can be controlled by a 0-5 V analogue voltage signal between inputs K2 (+) and K1 (0V).

- 0 V (With the potentiometer in position 0 [min.]) minimum thyristor conduction, about 0 V arc voltage.
- 5 V (With the potentiometer in position 100 [max.]) max. thyristor conduction, about 50 V arc voltage.

10. PROCESSOR

The processor controls the arc voltage and the welding current, as well as communication with the PEH control unit and any other units that may be connected.

The power unit has two current limits:

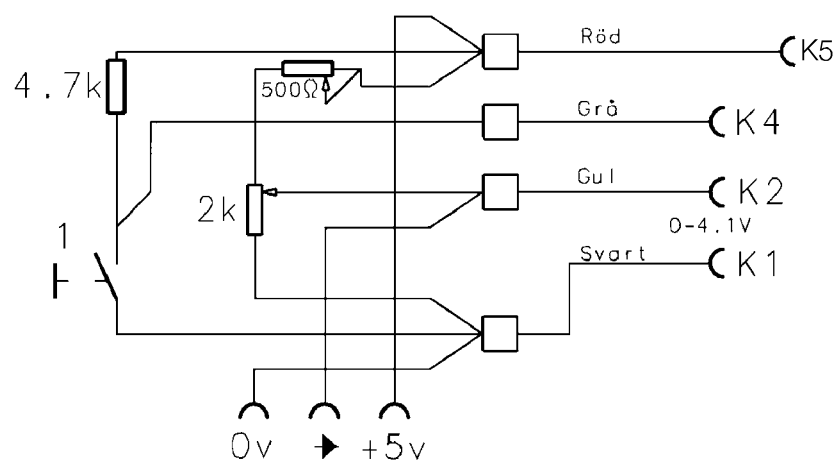
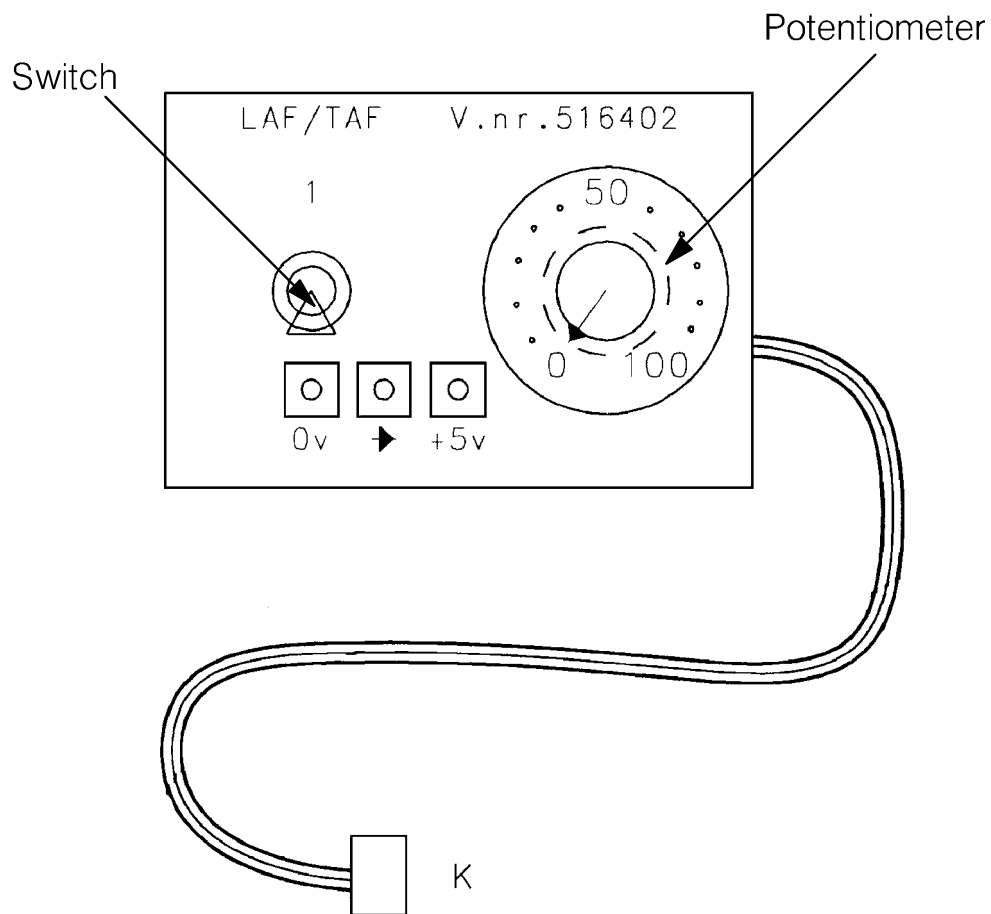
- A hardware current limit which reduces the current after about 10 ms.
- A lower current limit which is monitored by the processor.
Its setting is matched to the respective power unit, and it disconnects the power unit after about three seconds.

The current limits are:

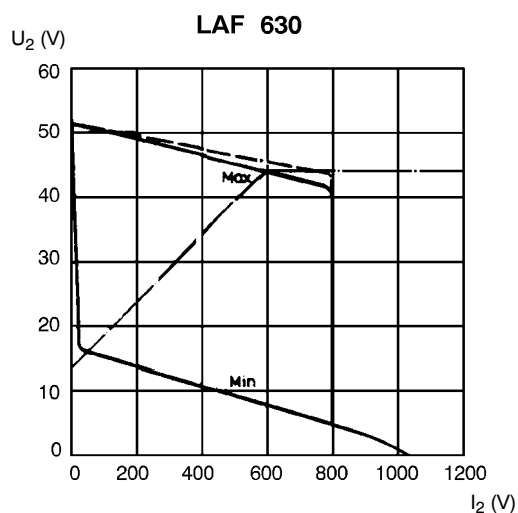
for LAF 630	700 A
for LAF 800	1050 A
for LAF 1250	1300 A
for LAF 1600	1700 A

The processor monitors the thermal cutout switch and lights indicating lamp HL2 if the temperature becomes too high, thus interrupting welding.

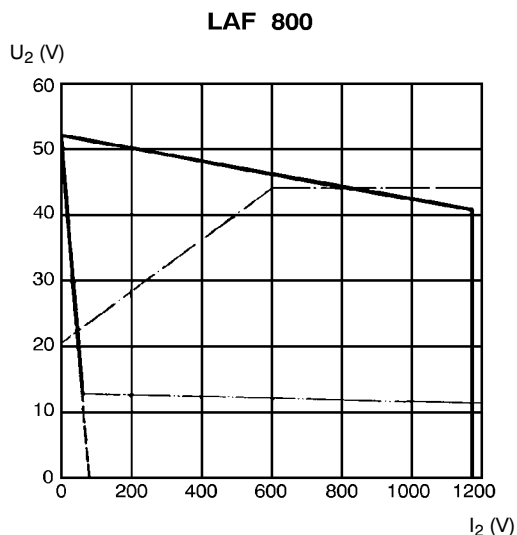
TEST DEVICE



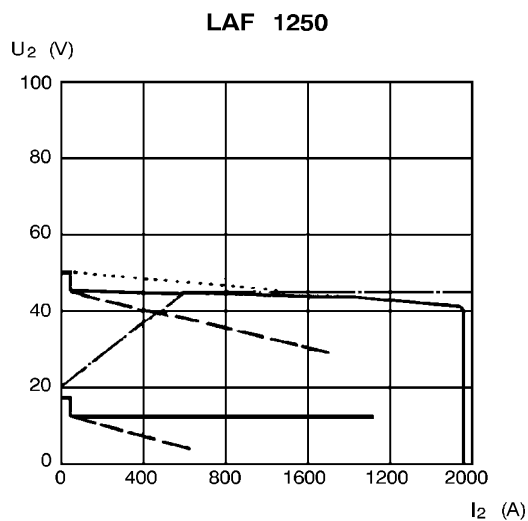
LOAD CHARACTERISTICS



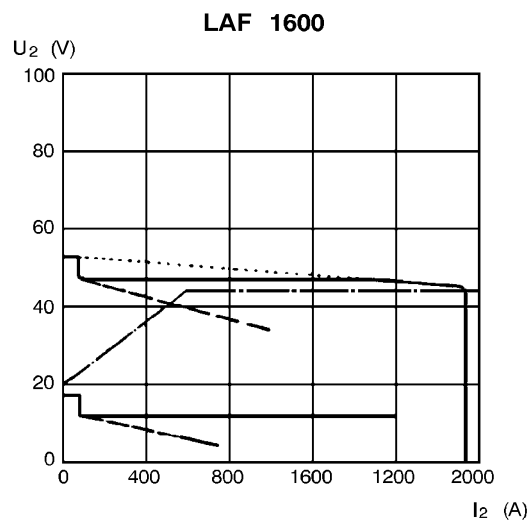
MIG/MAG: Min. 50 A 17 V
 Max. 630 A 44 V
 SAW: Min. 30 A 21 V
 Max. 630 A 44 V



MIG/MAG: Min. 50 A 17 V
 Max. 800 A 45 V
 SAW: Min. 40 A 22 V
 Max. 800 A 45 V



MIG/MAG: Min. 60 A 17 V
 Max. 1250 A 44 V
 SAW: Min. 40 A 22 V
 Max. 1250 A 44 V



SAW: Min. 40 A 22 V
 Max. 1600 A 46 V

INSTRUCTION MANUAL

This chapter contains an extract from edition 990114 of the LAF 630/800/1250/1600 instruction manual.

GENERAL

LAF 630/800/1250/1600 are remote-controlled 3-phase welding power sources designed for high-efficiency mechanical gas metal arc welding (MIG/MAG) or sub arc welding (SAW). It is always to be used in combination with ESAB's control box A2-A6 Process Controller (PEH).

LAF is fan-cooled and monitored by a thermal overload protection. When the protection enters into action a yellow indicating lamp on the front panel goes on and is reset automatically as soon as the temperature has gone down to an acceptable level.

The welding power sources and the control unit are linked together over a 2-wire bus enabling precision control of the welding process.

All welding parameter settings for the power source can be made by the operator on the front panel of the control unit. The operation of the power source is completely controlled and monitored by this unit. Even the start and stop qualities can be set by way of the control unit. The preset welding current parameters can also be monitored in the course of welding.

For more detailed information regarding the settings and the working mode of the welding power source, please refer to the A2-A6 Process Controller (PEH) instruction manual.

Technical data

	LAF 630	LAF 800	LAF 1250	LAF 1600
Voltage	400/415 V, 3~50 Hz 400/440 V, 3~60 Hz	400/415/500 V, 3~50 Hz 400/440/550 V, 3~60 Hz	400/415/500 V, 3~50 Hz 400/440/550 V, 3~60 Hz	400/415/500 V, 3~50 Hz 400/440/550 V, 3~60 Hz
Permissible load at:				
100 % duty cycle	500 A/39 V	800 A /44 V	1250 A/44 V	1600 A /44 V
80 % duty cycle	560 A/42 V	--	--	--
60 % duty cycle	630 A/44 V	--	--	--
Setting range				
MIG/MAG	50A/17V- 630A/44V	50A/17V- 800A/45V	60A/17V-1250A/44V	--
SAW	30A/21V- 630A/44V	40A/22V- 800A/45V	40A/22V-1250A/44V	40A/22V-1600A/46V
No-load voltage	52 V	52 V	51 V	54 V
No-load power	145 W	145 W	220 W	220 W
Efficiency	0,81	0,84	0,87	0,86
Power factor	0,92	0,95	0,92	0,87
Weight	230 kg	330 kg	490 kg	585 kg
Dimensions LxWxH	540 x 460 x 930 720 x 885 x 930 (including wheels)	646 x 552 x 1090	774 x 598 x 1430	774 x 598 x 1430
Class of enclosure	IP 23	IP 23	IP 23	IP 23
Class of application	S	S	S	S

Enclosure class

The **IP** code indicates the enclosure class, i. e. the degree of protection against penetration by solid objects or water. Equipment marked **IP 23** is designed for indoor and outdoor use.

Application class

The symbol **S** indicates that the power source is designed for use in areas with increased electrical hazard.

INSTALLATION

General

The installation shall be executed by a skilled person.

Unpacking and placement

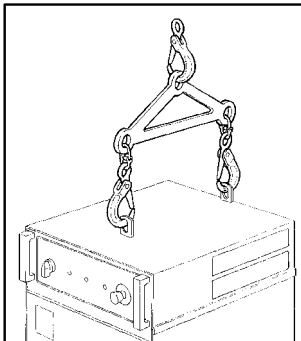


WARNING - TIPPING RISK!

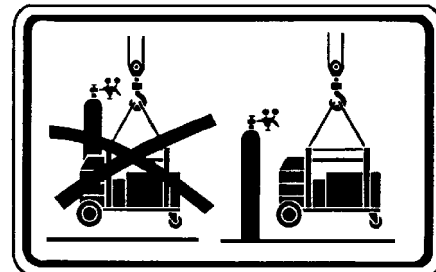
Fasten the equipment – particularly if the ground is uneven or slanting.

- Place the welding power source on a level foundation, don't forget to block the wheels for LAF 630.
- Make sure there is nothing to prevent the cooling.

LIFTING INSTRUCTIONS



LAF 630

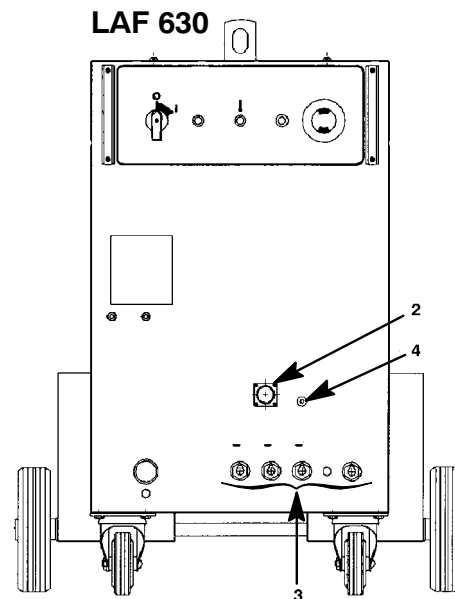
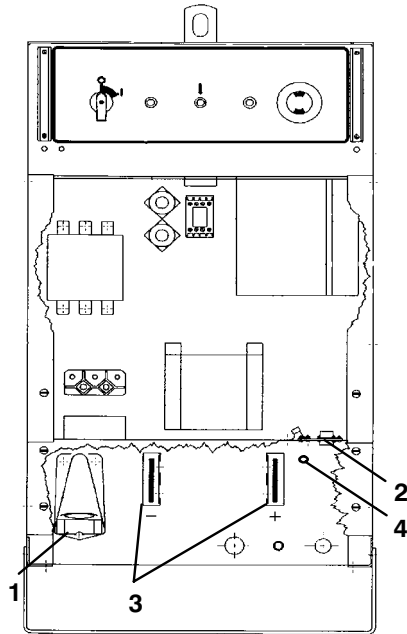


Connections

- On delivery the welding power source is connected for 400 V. For other supply voltage, switch over to the desired voltage on the main transformer and the control transformer according to the connection instructions on page 28.
- Make sure the mains cable has the right sectional area and fuse it with an adequate fuse according to applicable local directions (see table on page 25).
- Connect the earth cable to the screw marked
- Tighten the cable support (1).
- Connect the mains cable to the main terminal blocks L1, L2 and L3.
- Connect the control cable between the LAF welding power source and the control unit to the 12-pole contact (2) inside the welding power source.
- Connect 1 pin socket measure cable (4).
- Connect a suitable welding and return cable to the contacts (3) marked + and - on the front of the power source.

LAF 630 with MIG/MAG-welding

- Connect the welding cable from the wire feed unit to the socket marked +.
- Connect the return cable from the workpiece to either of the sockets marked - .
 - **Socket A** is used for short arc welding (this sheet or root beads, and aluminium).
 - **Socket B** is used for short arc welding, but gives a slightly hotter welding cycle than socket A.
 - **Socket C** is used for spray arc welding in thick plate.
- Connect the water cooling unit, if applicable.



Mains connection

LAF 630	50 Hz		60 Hz	
Voltage V	400	415	400	440
Current A 100%	40	39	40	39
80%	45	43	45	43
60%	50	49	50	49
Cable area mm ²	4 x 16	4 x 16	4 x 16	4 x 16
Fuse, slow A	50	50	50	50

LAF 800	50 Hz			60 Hz		
Voltage V	400	415	500	400	440	550
Current A 100%	64	64	52	64	64	52
Cable area mm ²	4 x 16	4 x 16	4 x 16	4 x 16	4 x 16	4 x 16
Fuse, slow A	63	63	63	63	63	63

LAF 1250	50 Hz			60 Hz		
Voltage V	400	415	500	400	440	550
Current A 100%	99	99	80	99	99	80
Cable area mm ²	3x35+ 25	3x35+ 25	3x25+ 16	3 x35+ 25	3 x35+ 25	3x25+ 16
Fuse, slowA	125	125	80	100	100	80

LAF 1600	50 Hz			60 Hz		
Voltage (V)	400	415	500	400	440	550
Current (A) 100%	136	136	108	136	136	108
Cable area mm ²	3 x 70+35	3 x 70+35	3 x 50+35	3x70+ 35	3x70+ 35	3x70+ 35
Fuse, slow A	160	160	125	160	160	125

PC board

DIP switches

The Circuit board (AP1) has two DIP switches (SW1 and SW2) which are preset on delivery. The settings are not to be changed.

For the supply of spare parts the settings of the DIP switches must be checked (and set, if necessary) before fitting the PC board into the welding power source.

- **DIP switch SW1.**

To make the communication with the A2-A6 Process Controller (PEH) work DIP switch 1 (SW1) must be set.

- **DIP switch SW2.**

DIP switch 2 (SW2) must be set in order to inform the A2-A6 process controller (PEH) about the rating of the power source that is connected.

Setting of DIP switch SW1

- Set pole 6 to position “OFF” and all other poles to position “ON”.

Setting of DIP switch SW2

LAF 630

- Set all poles to “ON” position.

LAF 800

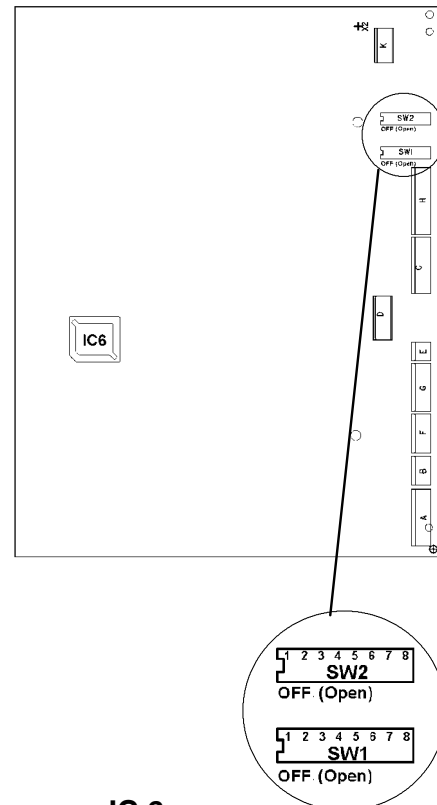
- Set pole 1 to “OFF” position and all other poles to “ON”.

LAF 1250

- Set pole 2 to “OFF” position and all other poles to “ON”.

LAF 1600

- Set pole 1 and 2 to “OFF” position and all other poles to “ON”.



Welding power source program

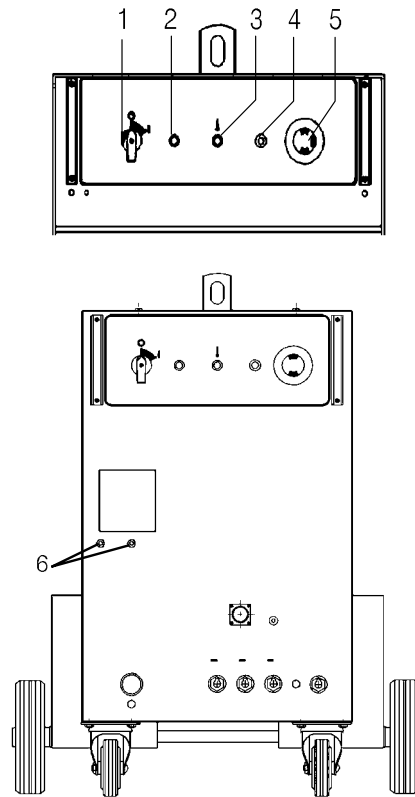
The welding power source program is stored in the flash memory **IC 6**. The capsule is fitted in a holder and is replaceable.

OPERATION

Controls

The front panel contains:

- 1** Main switch (QF), breaking the incoming mains voltage for the welding power source.
- 2** Indicating lamp (white), showing that the main switch is activated.
- 3** Indicating lamp (yellow), showing that the thermal protection has entered into action due to overheating in the transformer. The lamp is reset when the temperature has gone down to an acceptable level.
- 4** Pushbutton, for the resetting of automatic fuse FU2 for 42 V supply voltage.
- 5** Emergency pushbutton. When the button is activated the main contactor in the power source trips and the supply voltage for the control box is broken. (The emergency button on the control unit has the same function).
- 6 LAF 630**
Pushbutton, for the resetting of automatic fuse FU4 for 230 V supply voltage.



Start-up

- Connect the return cable to the work piece.
- Set the main switch (1) to position “I”.
- The white indicating lamp (2) goes on and the fan starts.
- Set the welding parameters and start welding by way of the control box (see the A2-A6 Process Controller 443 745-XXX instruction manual).

MAINTENANCE

Cleaning

- Clean the welding power source as necessary.
Dry compressed air is recommended for the purpose.

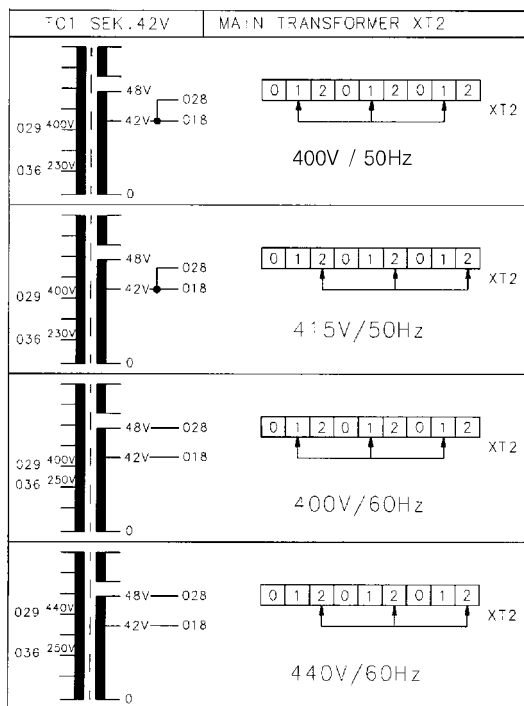


WARNING!

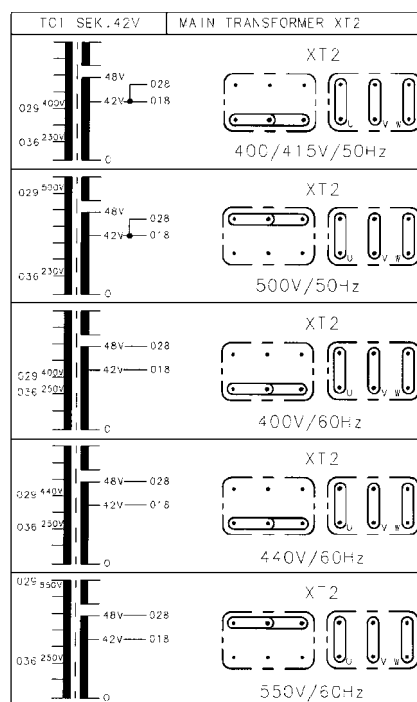
Blocked air inlets or outlets will lead to overheating.

CONNECTION INSTRUCTION

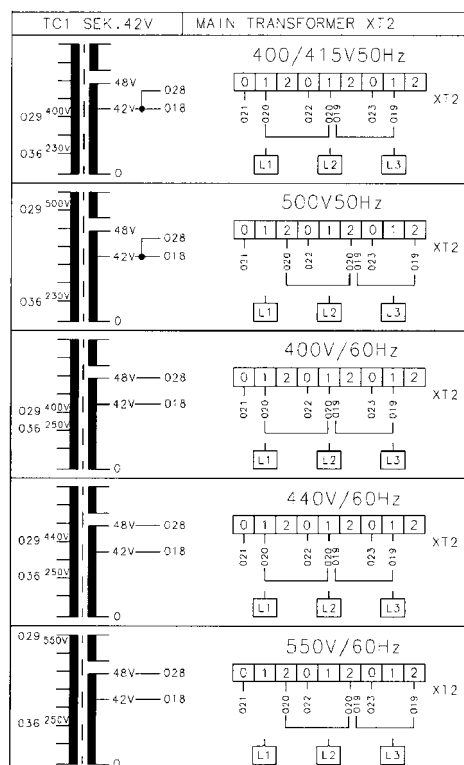
LAF 630



LAF 800



LAF 1250/ 1600

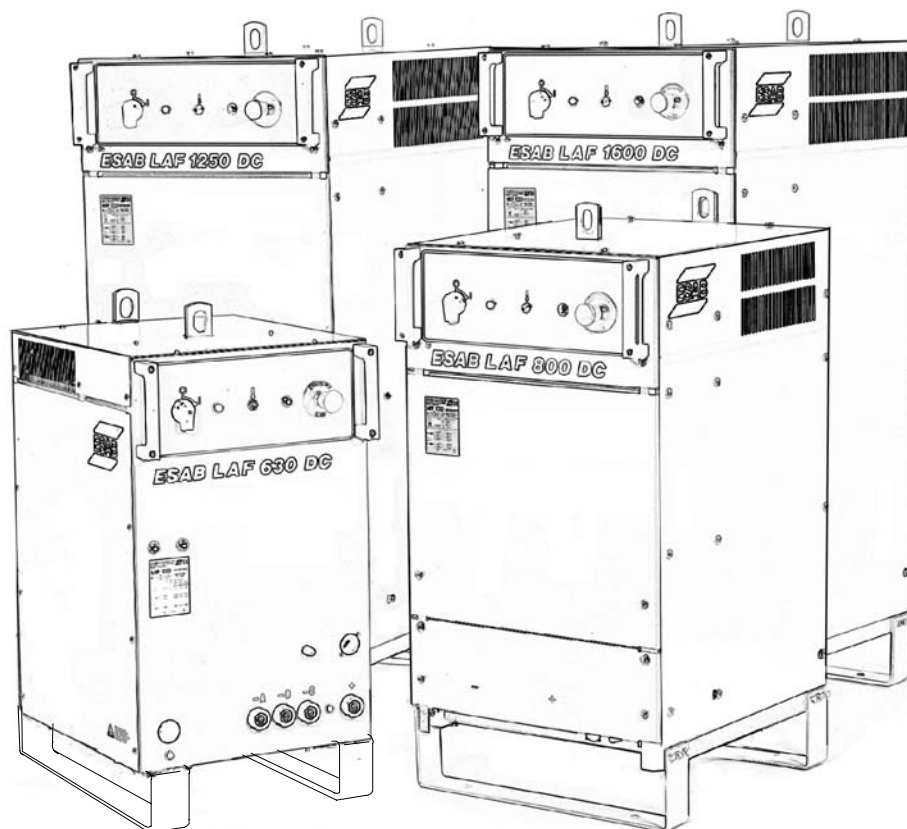


SPARE PARTS LIST

Edition 990409

LAF 630/800/1250/1600

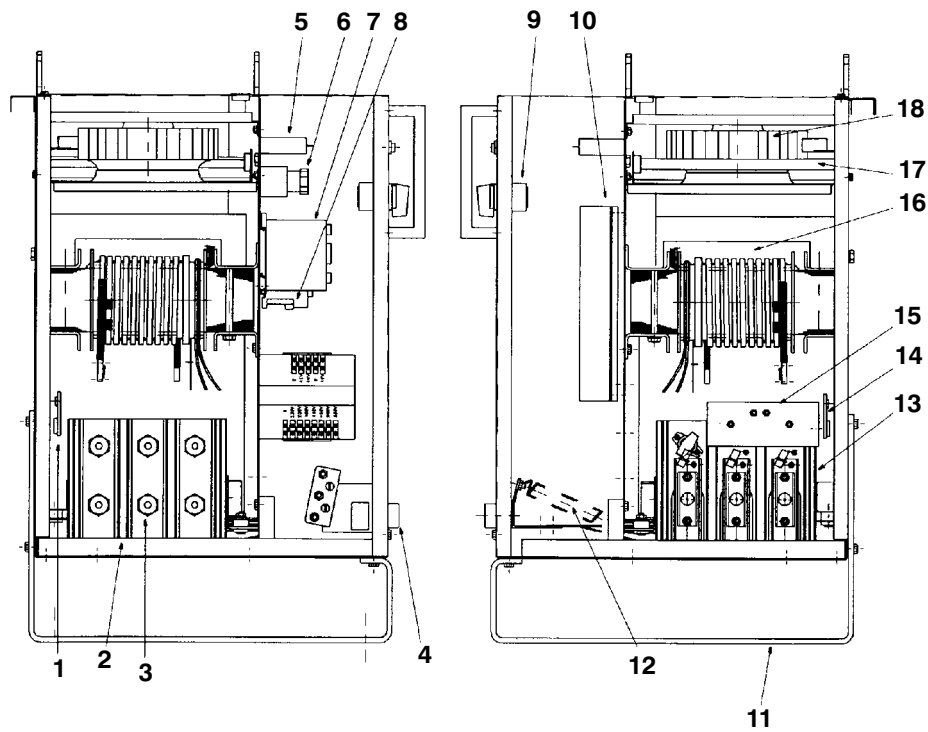
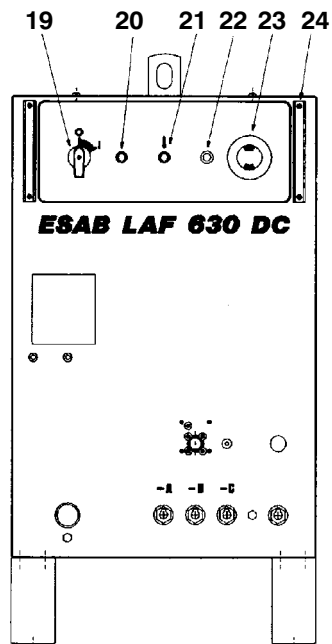
Spare parts are to be ordered through the nearest ESAB agency as per the list on the back of the cover. Kindly indicate type of unit, serial number, denominations and ordering numbers according to the spare parts list.



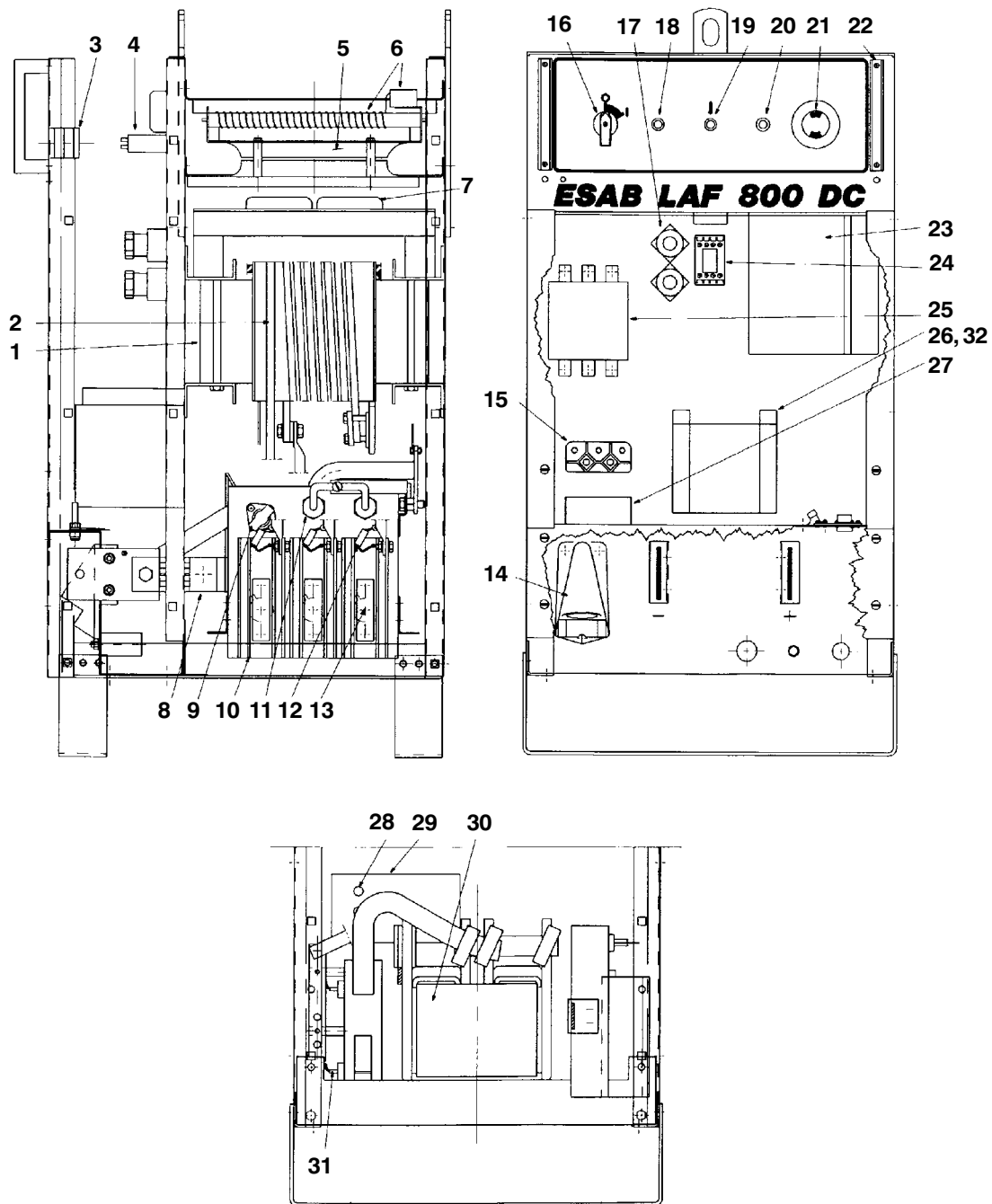
Ordering no.	Denomination	Notes
0456 320 880	Welding power source	LAF 630
0456 321 880	Welding power source	LAF 800
0456 323 880	Welding power source	LAF 1250
0456 324 880	Welding power source	LAF 1600

C = Component designation in the circuit diagram

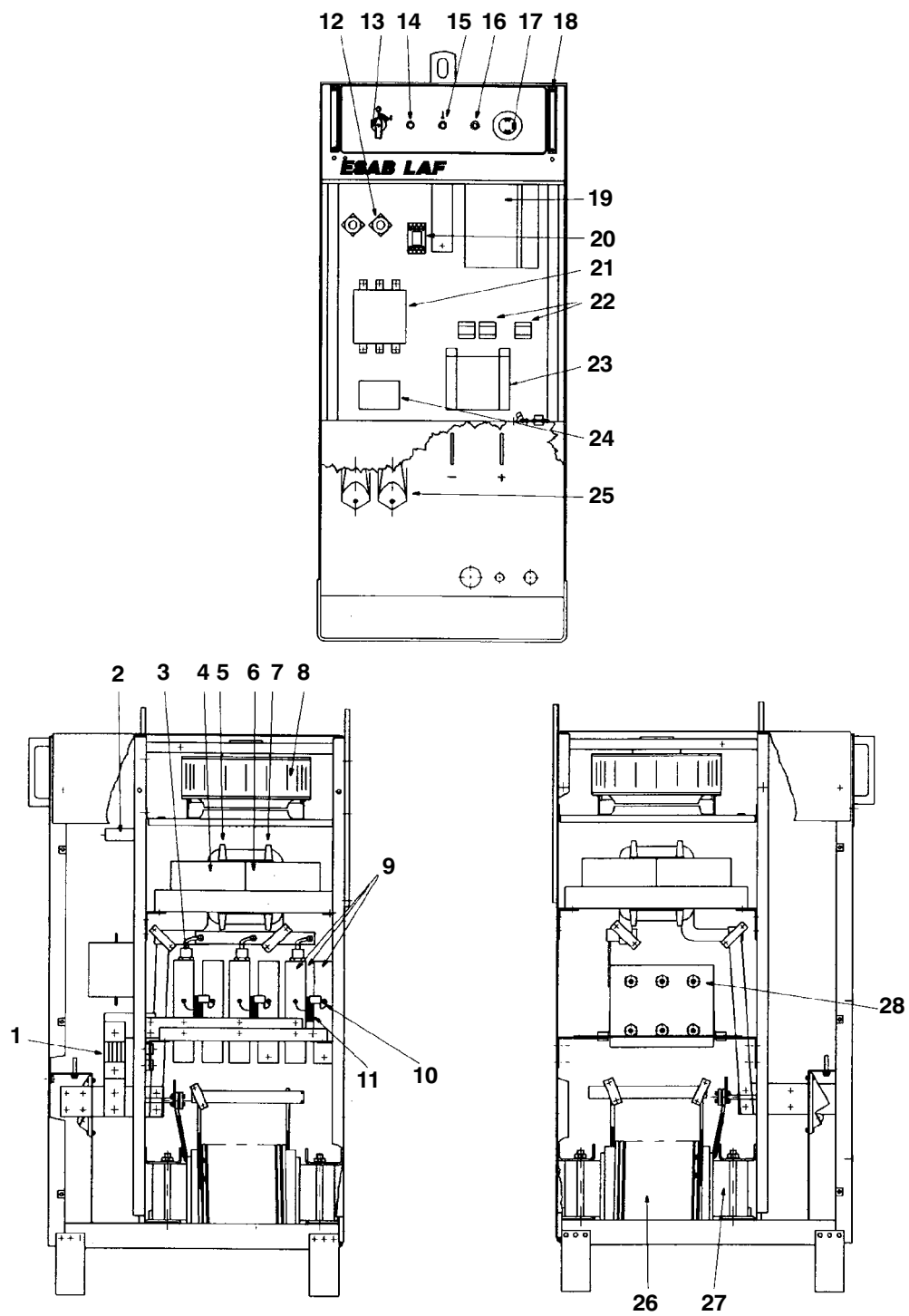
Item	Qty.	Ordering no.	Denomination	Remarks	C
		0456 320 880	LAF 630		
1	1	0321 033 880	Diode bridge		V3
2	1	0320 415 880	Diode bridge		
3	6	0490 600 626	Silicon diode		V2
4	4	0160 362 881	Cable connector		
5	1	0318 060 001	Capacitor		C4
6	2	0567 200 610	Fuse	16 A, 500 V	FU1
7	1	0193 503 001	Contactor		KM1
8		0193 296 101	Contactor		KM2
9	1	0320 746 001	Switch		QF
10	1	0486 368 880	Circuit board		AP1
	1	0486 525 880	Flash memory		IC6
11		0457 202 001	Foot		
12	1	0320 007 001	Resistor		
13	1	0320 620 880	Thyristor bridge		
14	1	0321 033 880	Diode bridge		V3
15	1	0320 622 881	Diode bridge		V4
16	1	0320 460 885	Transformer		TM1
17	1	0321 003 880	Resistor		R3
18	1	0320 286 001	Fan		M1
19	1	0318 113 003	Main switch (black)		QF
20	1	0192 576 004	Indicating lamp (white)		HL1
21	1	0192 576 304	Indicating lamp (yellow)		HL2
22	1	0193 586 103	Automatic fuse	15 A	FU2
23	1	0191 632 202	Emergency stop		
24	2	0156 388 001	Handle		



Item	Qty	Ordering no.	Denomination	Remarks	C
		0456 321 880	LAF 800		
1	1	0469 844 882	Transformer		TM1
2	1	0469 841 884	Transformer coil		
	1	0469 841 885	Transformer coil		
	1	0469 841 886	Transformer coil		
3	1	0320 746 001	Switch		
4	1	0318 060 001	Capacitor		C4
5	1	0318 022 001	Fan		M1
6	1	0321 003 881	Resistor		R3
7	2	0040 894 001	Connection block		XT2
8	1	0551 202 980	Shunt		RS1
9	1	0319 445 001	Thermal guard		ST1
10	1	0320 116 881	Thyristor bridge		
11	2	0490 600 606	Silicon diode		V4
12	3	0041 051 606	Contact protection		Z1, Z2, Z3
13	3	0320 946 001	Thyristor		V1
14		0158 115 880	Cable inlet		
15	1	0162 772 001	Connection block		
16	1	0318 113 003	Main switch (black)		QF
17	2	0567 200 610	Fuse	16 A, 500 V	FU1
18	1	0192 576 004	Indicating lamp (white)		HL1
19	1	0192 576 304	Indicating lamp (yellow)		HL2
20	1	0193 586 103	Automatic fuse	15 A	FU2
21	1	0191 632 202	Emergency stop		
22	2	0156 388 001	Handle		
23	1	0486 368 880	Circuit board		AP1
	1	0486 525 880	Flash memory		IC6
24		0193 296 101	Contactactor		KM2
25	1	0193 358 102	Contactactor		KM1
26	1	0319 470 016	Control transformer	42 V, 900 VA	TC1
27	1	0486 224 880	Circuit board, EMC filter		AP2
28	3	0321 468 003	Silicon diode		
29	1	0321 489 880	Base current bridge		
30	1	0318 040 883	Inductor		L1
31		0490 600 626	Silicon diode		V2
32	1	0567 900 129	Fuse	315 mA	FU3



Item	Qty.	Qty.	Ordering no.	Denomination	Remarks	C
		X	0456 323 880	LAF 1250		
	X		0456 324 880	LAF 1600		
1	1	1	0551 203 081 0551 203 082	Shunt Shunt	1500 A 2000 A	C4
2			0191 085 105	Capacitor	400 V	
3	1	1	0490 600 606	Silicon diode		
4	1		0320 445 883	Inductor		
5	1		0320 444 883	Inductor coil		M1
6		1	0320 445 882	Inductor		
7		1	0320 444 882	Inductor coil		
8	1	1	0320 951 001	Fan		
9	3	3	0320 924 882 0321 452 880	Thyristor bridge Thyristor bridge		V1 V1
10			0041 051 606	Contact protection		
11	1	1	0320 946 001 0321 427 001	Thyristor Thyristor	1100 A/ 300 V 1500 A/ 500 V	
12	2	2	0567 200 610	Fuse	16 A, 500 V	
13	1	1	0318 113 003	Main switch (black)		QU
14	1	1	0192 576 004	Indicating lamp (white)		HL1
15	1	1	0192 576 303	Indicating lamp (yellow)		HL2
16	1	1	0193 586 103	Automatic fuse	15 A	FU2
17	1	1	0191 632 202	Emergency stop		AP1 IC6
18	2	2	0156 388 001	Handle		
19	1	1	0486 368 880	Circuit board		
	1	1	0486 525 880	Flash memory		
20			0193 296 101	Contactor		KM1
21	1	1	0442 849 001	Contactor	42 V/ 50 Hz	
22	3	3	0319 828 001	Transformer		TC2
23			0319 470 016	Contract transformer	42 V, 900 VA	TC1
24	1	1	0486 224 880	Circuit board, EMC filter		AP2
25	2	2	0158 115 880	Cable inlet		V2
26	1	1	0469 842 880 0469 843 880	Transformer coil Transformer coil		
27	1	1	0469 845 880 0469 845 881	Transformer Transformer		
28			0490 600 626	Silicon diode		



ESAB subsidiaries and representative offices

Europe

AUSTRIA

ESAB Ges.m.b.H
Vienna-Liesing
Tel: +43 1 888 25 11
Fax: +43 1 888 25 11 85

BELGIUM

S.A. ESAB N.V.
Brussels
Tel: +32 2 745 11 00
Fax: +32 2 726 80 05

THE CZECH REPUBLIC

ESAB VAMBERK s.r.o.
Prague
Tel: +420 2 819 40 885
Fax: +420 2 819 40 120

DENMARK

Aktieselskabet ESAB
Copenhagen-Valby
Tel: +45 36 30 01 11
Fax: +45 36 30 40 03

FINLAND

ESAB Oy
Helsinki
Tel: +358 9 547 761
Fax: +358 9 547 77 71

FRANCE

ESAB France S.A.
Cergy Pontoise
Tel: +33 1 30 75 55 00
Fax: +33 1 30 75 55 24

GERMANY

ESAB GmbH
Solingen
Tel: +49 212 298 0
Fax: +49 212 298 204

GREAT BRITAIN

ESAB Group (UK) Ltd
Waltham Cross
Tel: +44 1992 76 85 15
Fax: +44 1992 71 58 03

ESAB Automation Ltd

Andover
Tel: +44 1264 33 22 33
Fax: +44 1264 33 20 74

HUNGARY

ESAB Kft
Budapest
Tel: +36 1 20 44 182
Fax: +36 1 20 44 186

ITALY

ESAB Saldatura S.p.A.
Mesero (Mi)
Tel: +39 02 97 96 81
Fax: +39 02 97 28 91 81

THE NETHERLANDS

ESAB Nederland B.V.
Utrecht
Tel: +31 30 248 59 22
Fax: +31 30 248 52 60

NORWAY

AS ESAB
Larvik
Tel: +47 33 12 10 00
Fax: +47 33 11 52 03

POLAND

ESAB Sp.z.o.o
Warszaw
Tel: +48 22 813 99 63
Fax: +48 22 813 98 81

PORTUGAL

ESAB Lda
Lisbon
Tel: +351 1 837 1527
Fax: +351 1 859 1277

SLOVAKIA

ESAB Slovakia s.r.o.
Bratislava
Tel: +421 7 44 88 24 26
Fax: +421 7 44 88 87 41

SPAIN

ESAB Ibérica S.A.
Alcobendas (Madrid)
Tel: +34 91 623 11 00
Fax: +34 91 661 51 83

SWEDEN

ESAB Sverige AB
Gothenburg
Tel: +46 31 50 95 00
Fax: +46 31 50 92 22

ESAB International AB

Gothenburg
Tel: +46 31 50 90 00
Fax: +46 31 50 93 60

SWITZERLAND

ESAB AG
Dietikon
Tel: +41 1 741 25 25
Fax: +41 1 740 30 55

North and South America

ARGENTINA

CONARCO
Buenos Aires
Tel: +54 11 4 753 4039
Fax: +54 11 4 753 6313

BRAZIL

ESAB S.A.
Contagem-MG
Tel: +55 31 333 43 33
Fax: +55 31 361 31 51

CANADA

ESAB Group Canada Inc.
Mississauga, Ontario
Tel: +1 905 670 02 20
Fax: +1 905 670 48 79

MEXICO

ESAB Mexico S.A.
Monterrey
Tel: +52 8 350 5959
Fax: +52 8 350 7554

USA

ESAB Welding & Cutting Products
Florence, SC
Tel: +1 843 669 44 11
Fax: +1 843 664 44 58

Asia/Pacific

AUSTRALIA

ESAB Australia Pty Ltd
Ermington
Tel: +61 2 9647 1232
Fax: +61 2 9748 1685

CHINA

Shanghai ESAB A/P
Shanghai
Tel: +86 21 6539 7124
Fax: +86 21 6543 6622

INDIA

ESAB India Ltd
Calcutta
Tel: +91 33 478 45 17
Fax: +91 33 468 18 80

INDONESIA

P.T. Esabindo Pratama
Jakarta
Tel: +62 21 460 01 88
Fax: +62 21 461 29 29

MALAYSIA

ESAB (Malaysia) Snd Bhd
Selangor
Tel: +60 3 703 36 15
Fax: +60 3 703 35 52

SINGAPORE

ESAB Singapore Pte Ltd
Singapore
Tel: +65 861 43 22
Fax: +65 861 31 95

ESAB Asia/Pacific Pte Ltd

Singapore
Tel: +65 861 74 42
Fax: +65 863 08 39

SOUTH KOREA

ESAB SeAH Corporation
Kyung-Nam
Tel: +82 551 289 81 11
Fax: +82 551 289 88 63

THAILAND

ESAB (Thailand) Ltd
Samutprakarn
Tel: +66 2 393 60 62
Fax: +66 2 748 71 11

UNITED ARAB EMIRATES

ESAB Middle East
Dubai
Tel: +971 4 338 88 29
Fax: +971 4 338 87 29

Representative offices

BULGARIA

ESAB Representative Office
Sofia
Tel/Fax: +359 2 974 42 88

EGYPT

ESAB Egypt
Dokki-Cairo
Tel: +20 2 390 96 69
Fax: +20 2 393 32 13

ROMANIA

ESAB Representative Office
Bucharest
Tel/Fax: +40 1 322 36 74

RUSSIA-CIS

ESAB Representative Office
Moscow
Tel: +7 095 937 98 20
Fax: +7 095 937 95 80

ESAB Representative Office

St Petersburg
Tel: +7 812 325 43 62
Fax: +7 812 325 66 85

Distributors

For addresses and phone numbers to our distributors in other countries, please visit our home page

www.esab.com



ESAB Welding Equipment AB
SE-695 81 LAXÅ
SWEDEN
Phone +46 584 81 000
Fax +46 584 123 08

www.esab.com

